
PASSIVE SAFETY SYSTEM

2-STAGE AIRBAG

INTRODUCTION

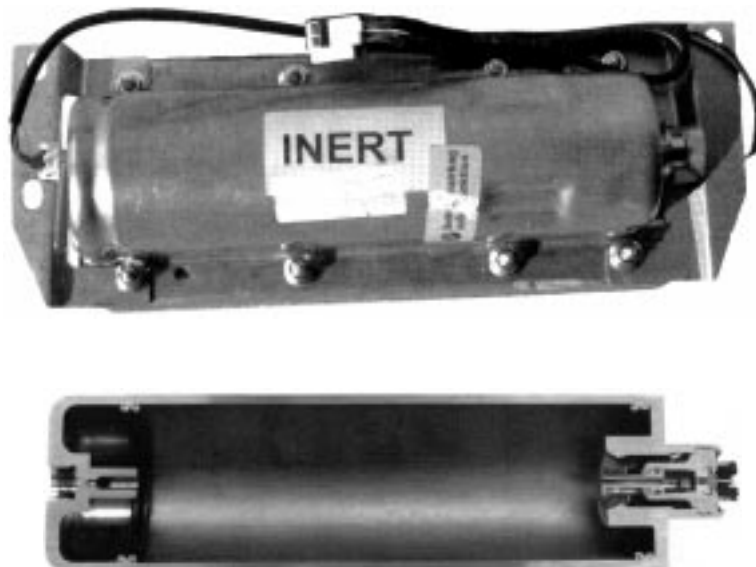
The new passenger front airbag is a further step in passenger protection offered by the supplemental restraint system. The new passenger airbag features a 2-stage air bag activation system.

The E38 and E39 will receive the new 2-stage airbag system as of 9/98 production..

The passenger's airbag is the only modification to the system. The remainder of the SRS will remain the MRS II system carried over from the 1998 models. The new system is modified from the existing system as follows:

- New pressure accumulator generator
- New airbag - volume of 105 liters
- Two ignition capsules - for two stage activation
- Propellant gas made from 13.5% hydrogen and 86.5% oxygen
- Deployed units can be disposed of as scrap metal

The use of two ignition stages, coupled with the lower volume and new propellant, optimizes the deployment of the airbag and makes it less aggressive when the airbag inflates. Although BMW is using the term "DEPOWERED", when referring to this new assembly, It continues to provide the level of protection offered by the previous passenger side front airbag assembly.



COMPONENTS

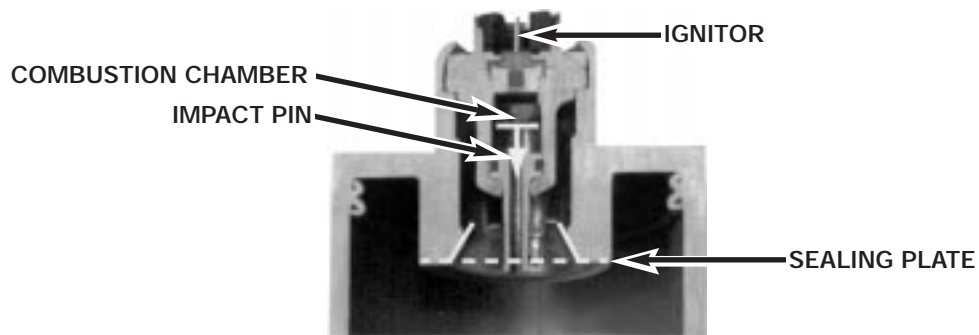
The main new component of the new system is the gas generator which mounts below the airbag on the passenger's side of the dashboard. The gas generator consists of a pressure chamber with an ignition set at each end. A hose connects the airbag with the pressure chamber.

PRESSURE CHAMBER

The propellant charge in the chamber is a mixture of approximately 13.5% hydrogen and 86.5% oxygen under pressure.

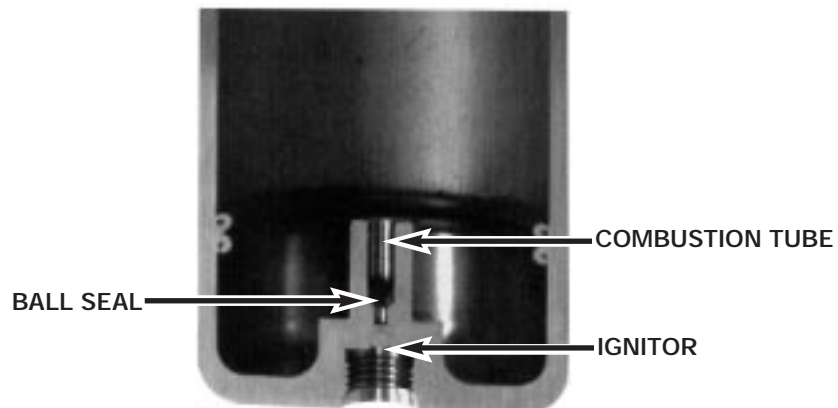
IGNITION STAGE ONE

The main ignition capsule consists of the ignitor, combustion chamber, the impact pin and the sealing plate.



IGNITION STAGE TWO

The second ignition capsule consists of an ignitor, ball seal and combustion tube.



AIRBAG ACTIVATION

Ignition stage one is always the first to be ignited during an impact. Ignition stage two is ignited after a time threshold that is programmed in the MRS II control module. The two stage activation is optimized by the airbag's inflation curve for each model.

When the ignition capsule is ignited, the impact pin is pushed against the sealing plate and the passageway for inflating the airbag is opened. The flame from the ignition capsule ignites the propellant gas and the expanding gas is forced through the tube into the airbag.

After the timed threshold, the second stage is ignited and the ball seal is forced off of its seat. The flame from the second stage ignites the propellant on the opposite side of the pressure chamber and causes further expansion of the gasses. This ensures that the required volume of gas is produced by the pressure chamber to fully inflate the airbag.

After inflation, the gasses are allowed to escape from the airbag as with previous systems. However, the escaping gasses are not harmful to the passengers of the vehicle.

